



High Flow Filtration Performance in a Compact Design

- ☑ Innovative technology to achieve flow rates up to 113 m³/hr (500 gpm) per element
- ☑ Absolute-rated for consistent product quality
- ☑ Operator-friendly cartridge and housing system
- ☑ Unique design to reduce capital investment expenses

The CUNO™ High Flow Filtration System

The CUNO™ High Flow Filtration System is an advanced design that uses 3M Innovation and CUNO’s extensive filtration experience to deliver a high flow filter in a compact housing design. When compared to conventional cartridge systems, this system provides the following advantages:



High Flow Capability

The unique construction of CUNO™ High Flow Filters (patent pending) permits flow rates of up to 113 m³/hr (500 gpm) in a single cartridge. The result? Fewer filter elements to accommodate your flow requirements. In fact, the CUNO™ High Flow Filtration System requires as few as one-tenth the number of elements as competitive 2.5” (63,5 mm) pleated cartridges (see Figure 1).

Compact Design

Using fewer elements combined with an outside-to-in flow path enables a reduction in the size of housing required for your application. The CUNO™ High Flow Housing takes up as little as one-half the size of competitive housings for a given flow rate. The result is lower capital investment costs and a compact footprint that saves valuable plant space (see Figure 1).

Ease of Use

The CUNO™ High Flow Filtration System is designed with ease-of-use in mind. From a user-friendly, ergonomically designed handle that makes cartridge installation and removal easier without the use of special tools or other hardware, to a unique “twist-to-lock” cartridge seating mechanism that provides a positive seal, the CUNO™ High Flow System facilitates easy operation and maintenance of your filter system.

| CUNO™ High Flow Filter Applications |
|---|
| Industrial - Municipal Water, RO Prefiltration, Reclaimed Water, Coolants, Nozzle Protection, Boiler Condensate |
| Chemical - Quench Water, Aqueous Salt Solutions, Final Products |
| Petrochemicals - Waterflooding, Produced Water, Enhanced Oil Recovery, Completion Fluids, Amine Sweetening, Final Products |
| Electronics - RO Prefiltration, Process Water |
| Food & Beverage - Process Water |
| Pharmaceutical - Process Water |

| Features | Benefits |
|--|---|
| <ul style="list-style-type: none"> High flow capability of up to 113 m³/hr (500 gpm) per cartridge | <ul style="list-style-type: none"> Reduced Filter Usage – minimizes product loss, labour, disposal costs, operator exposure, and downtime for filter change-out |
| <ul style="list-style-type: none"> Patent Pending Compound Radial Pleat design | <ul style="list-style-type: none"> High loading capacity for long life and lower cost filtration |
| <ul style="list-style-type: none"> Compact design | <ul style="list-style-type: none"> Smaller housing minimizes capital expense requirements Reduces system footprint |
| <ul style="list-style-type: none"> Absolute rating | <ul style="list-style-type: none"> Reproducible effluent quality throughout the filter’s life |
| <ul style="list-style-type: none"> Easy to Use | <ul style="list-style-type: none"> No special tools or hardware required for filter change-out – minimizes downtime “Twist to lock” seating mechanism provides positive seal Ergonomically designed handle – facilitates easy cartridge installation and removal |
| <ul style="list-style-type: none"> FDA compliant | <ul style="list-style-type: none"> Compatible in applications requiring direct food contact in food and beverage processing per 21 CFR. |

CUNO™ High Flow Filter Media

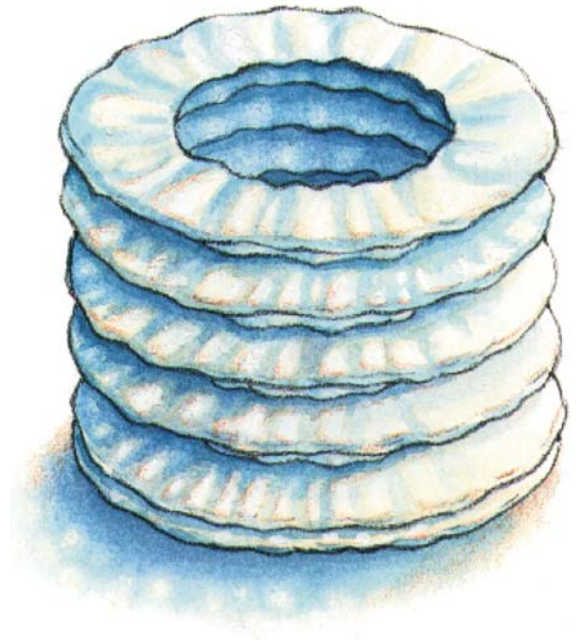
High Performance Media in an Innovative Design

CUNO™ High Flow Filters are designed using state-of-the-art technology, optimizing both performance and effluent quality to ensure customer satisfaction. The elements use a unique pleat design that results in a high usable filtering surface area per filter.

Radial pleat design

3M Innovation is at the heart of the CUNO™ High Flow Filter. A patent pending compound radial pleat design maximizes the usable surface area per filter. Blown microfibre forms the basis of the filter media, which is made to tightly controlled fibre diameter specifications to produce a media with absolute rated particle retention characteristics. Our unique manufacturing process embosses the media to produce a more uniform pleat pattern, which, in turn, allows greater utilization of the media by evenly distributing the fluid throughout the entire filter structure. This results in consistent particle retention in a compact, space-saving design.

Compound Radial Pleat design maximizes usable media surface area



Design Features

The CUNO™ High Flow Filter contains several features to combine high performance with easy operation.

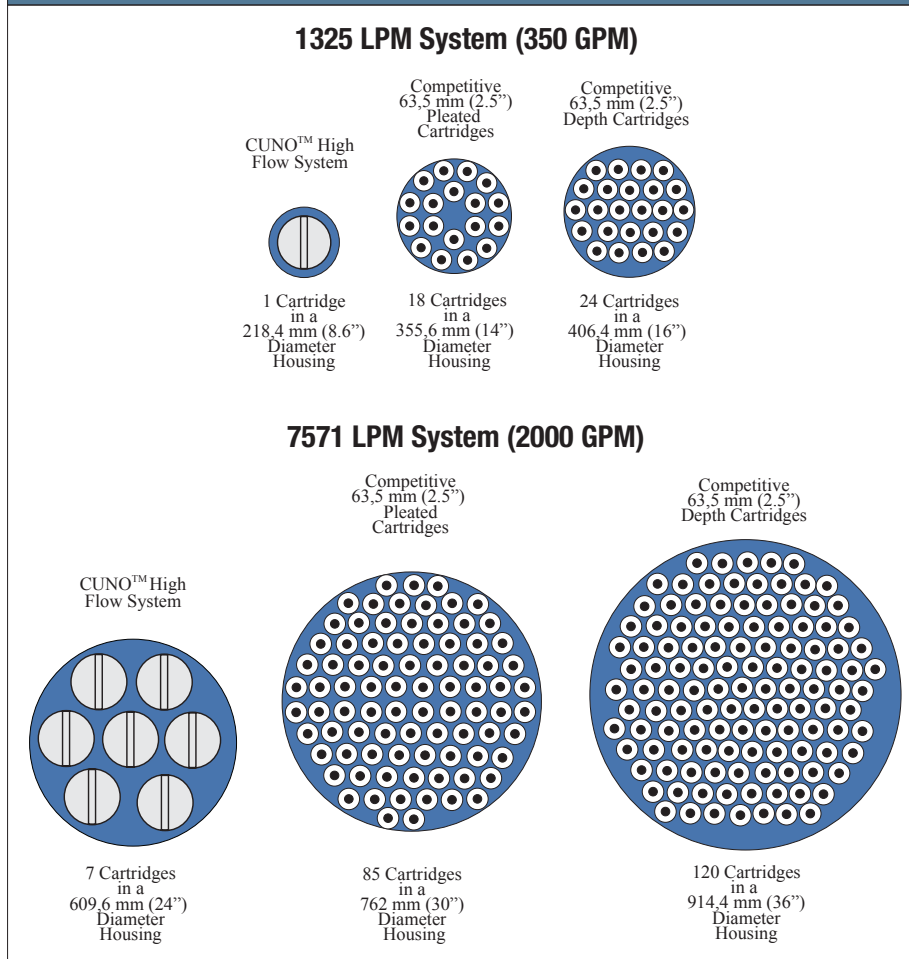


- A large diameter core allows up to 113 m³/hr (500 gpm) through a single filter element.
- An ergonomically designed handle has been designed to facilitate fast and easy insertion and removal without the use of special tools. Cartridges are simply inserted over a built-in guide tube.
- The seating mechanism uses a “twist to lock” design to provide a positive seal.

Filter Comparison

Consider the following benefits of the CUNO™ High Flow System over competitive 2.5" (63,5 mm diameter) cartridges in a 1325 lpm (350 gpm) and a 7571 lpm (2000 gpm) system*:

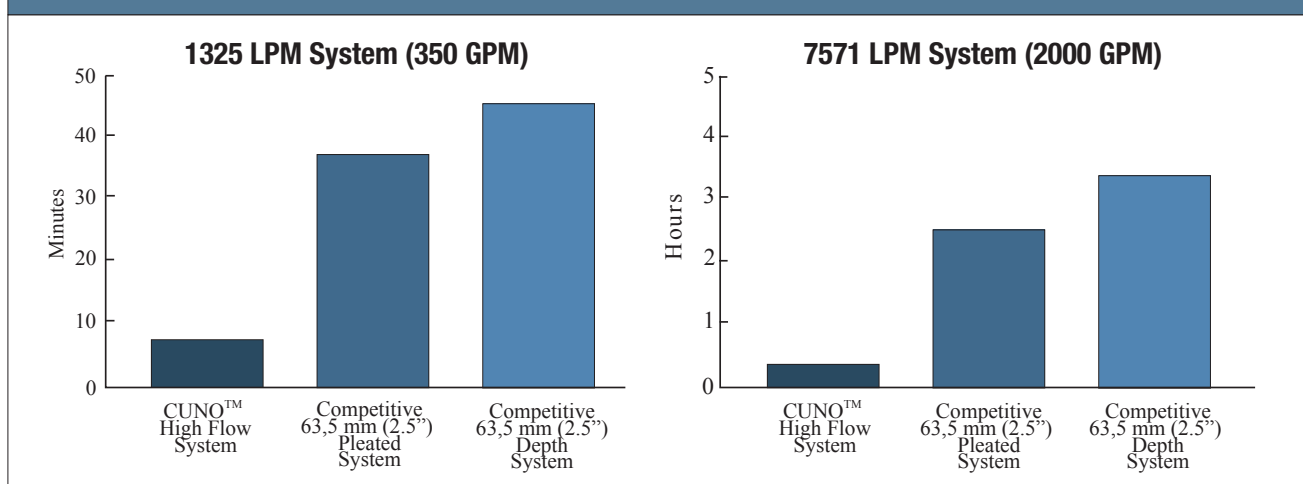
Figure 1 – Typical Cartridges Required & Housing Footprint Comparison



- The CUNO™ High Flow System requires 90% fewer cartridges as competitive 2.5" (63,5 mm diameter) cartridge systems for a given flow rate.
- CUNO™ High Flow Housings are 33% to 50% smaller than competitively sized housings for a given flow rate.
- Fewer filters and a user-friendly housing design means faster change-outs than competitively sized systems.

* Comparison assumes fluid viscosity of 1 cP

Figure 2 – Typical Time/Labour for Change-Out



CUNO™ High Flow Filter Specifications and Operating Parameters

Materials of Construction

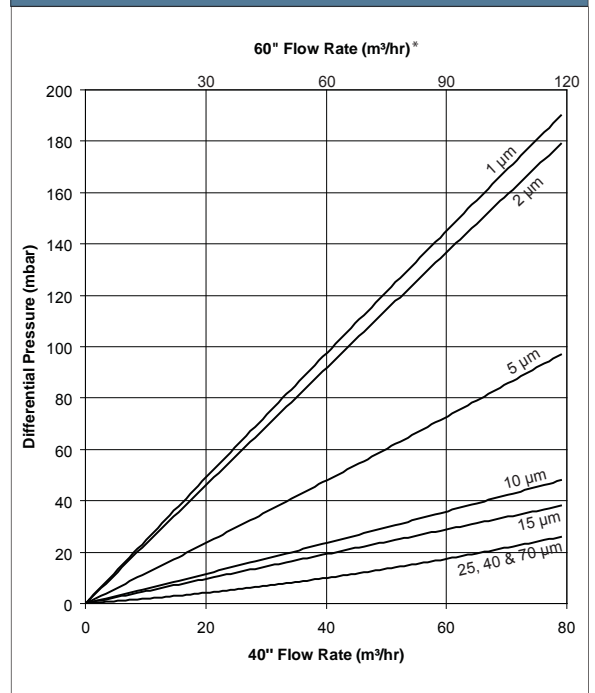
Filter Media - Each grade of the CUNO™ High Flow Filter is manufactured from melt-blown FDA compliant polypropylene microfibre media, providing high particle removal efficiency with broad chemical compatibility. No adhesives, binders, or silicone are used in the manufacturing process. The raw materials composing these filters are FDA compliant according to CFR Title 21. All support layers and hardware are constructed with polypropylene.

O-rings - O-rings are available in a variety of materials to suit your applications, including the standard nitrile, Ethylene Propylene Rubber (EPR), silicone, and fluorocarbon.

| CUNO™ High Flow Filter Element Specifications | | |
|---|---------------------------------|------------|
| Parameter | Element Length (nominal) | |
| | 40" | 60" |
| Removal Ratings (microns) | 1, 2, 5, 10, 15, 25, 40, and 70 | |
| Flow vs. Differential Pressure | See Figure 3 | |
| Filter Diameter (cm/inches) | 16.5 / 6.5 | |
| Filter Length (cm/inches) | 101.6 / 40 | 152.4 / 60 |

| Operating Parameters by Cartridge Length | | |
|--|------------------------------------|-----------|
| Operating Conditions | Elements Length (nominal) | |
| | 40" | 60" |
| Maximum Operating Temperature (°C/°F) | 71 / 160 | |
| Maximum Recommended Flow Rate in water @ 21°C/70°F (m³ per hr / gpm) | 80 / 350 | 113 / 500 |
| Maximum Forward Differential Pressure | 3.4 bar @ 20°C (50 psid @ 68°F) | |
| Recommended Change-out Differential Pressure | 2.4 bar @ 20°C (35 psid @ 68°F) | |
| Regulatory Status - All component materials of the CUNO™ High Flow polypropylene element are listed for food contact per 21 CFR. | | |

Figure 3 – Typical Cartridge Flow Rates



* estimated

| Fluid Compatibility | | | | | |
|------------------------|--------------|---------------------|--------------|----------------------|--------------|
| Chemical | Temperature | Chemical | Temperature | Chemical | Temperature |
| Acetic Acid 20% | 71°C (160°F) | Hydrogen Peroxide | 38°C (100°F) | Sodium Carbonate | 71°C (160°F) |
| Alkanolamines | 60°C (140°F) | Methyl Ethyl Ketone | 21°C (70°F) | Sodium Hydroxide 70% | 71°C (160°F) |
| Ammonium Hydroxide 10% | 71°C (160°F) | Mineral Oil | 21°C (70°F) | Sulfuric Acid 20% | 71°C (160°F) |
| Bleach 5.5% | 49°C (120°F) | Nitric Acid 20% | 49°C (120°F) | Sulfuric Acid 70% | 71°C (160°F) |
| Ethylene Glycol | 71°C (160°F) | Potassium Hydroxide | 60°C (140°F) | Urea | 71°C (160°F) |

The thermal and chemical resistance data presented in this brochure is for guidance only. Factors such as duration of exposure, fluid concentration, and temperature should also be considered. Thermal and chemical resistance should also be considered when choosing all materials exposed to fluids.



CUNO™ High Flow Filter Housings

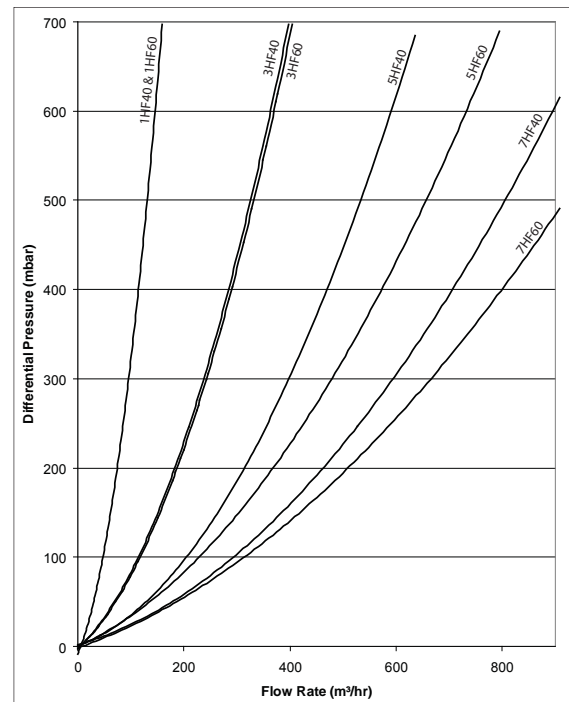
The CUNO™ High Flow Housings are specifically designed to deliver all of the system’s benefits in a compact footprint. Housings are available in standard designs, as well as customizable configurations to suit your specific needs. All standard CUNO™ High Flow Housings are designed, manufactured, tested, and code stamped in accordance with ATEX Group II, Category 3, T5 and PED 97/23/EC rated Category I. Stainless steel housing external surfaces are glass-bead blasted for a consistent, easy care finish.



The CUNO™ High Flow Housing is available in a variety of sizes to accommodate from 1 to 7 filter elements in both 40-inch and 60-inch lengths. Larger housings are available upon request. Housings are also available in horizontal or vertical configurations, depending on your needs. Choose the horizontal option to maximize ease of operation, or the vertical to minimize the system’s footprint.

| Features | |
|---|---|
| Horizontal | Vertical |
| • ATEX Code design | |
| • Robust cartridge centre-post design eliminates bulky support plates providing easy access to housing internals | |
| • Hinged cover for easy element change-outs | • User-friendly cover lifting device for easy element change-outs |
| • Handles liquid at pressures and temperatures of up to 10 bar and 121 °C | |
| • Manufactured from 304 or 316L stainless steel for excellent corrosion protection (carbon steel option available in multi-element housing) | |
| • Available for 40” and 60” element lengths | • Available for 40” element lengths |
| • Upstream and downstream gauge ports and drains | |
| Options | |
| • Corrosion allowance for carbon steel housing – consult factory | |
| • Choice of inlet/outlet flange size | |

Figure 4 – Typical Housing Flow Rates



Housing Specifications

| CUNO™ High Flow Housing Specification | | | | | | | | | |
|---------------------------------------|-----------------------|--------------------|---------------------------------|-------|---------------------------------|-------|--------------------------------|--------------------------|----------|
| Model | Nominal Diameter (mm) | Material | Inlet & Outlet Connection (DIN) | | Recommended Maximum Flow m³/hr* | | Maximum Pressure & Temperature | Vent & Drain Connections | |
| | | | 40” | 60” | 40” | 60” | | Vent | Drain |
| 1HF | 220 | 316L SS or 304L SS | DN100 | DN100 | 80 | 113 | 10 bar 110 °C | 1/4” *** | 1/2” *** |
| 3HF | 450 | | DN150 | DN200 | 198** | 339 | | 1/2” | 1” |
| 5HF | 500 | | DN200 | DN250 | 352** | 556** | | 1/2” | 1” |
| 7HF | 600 | | DN250 | DN300 | 556 | 791 | | 1” | 2” |

* Pressure drop across cartridge not included (see figure 3)
 ** Maximum flow rate based on nozzle size
 *** Only for Vertical Housings

Housing Dimensions

CUNO™ High Flow Housing Specifications

| | |
|--|--|
| Materials of Construction | 316L (1.4404 or equivalent) 304 (1.4307 or equivalent) This applies to materials in contact with the product. Other non contact items (including bolts etc.) may vary from this. |
| Pressure Equipment Directive 97/23/CE Operating Conditions | All vessels have been designed in accordance with the PED 97/23/CE for Group 1 and Group 2 fluids up to a maximum of 10 bar g and 90 degrees C. Restrictions will apply for gas or vapour applications. Please refer to supplier for specific cases. |
| ATEX 94/9/CE | Group II Category 3 – G&D (Other ratings are possible please refer to vendor) |
| Recommended Maximum Flow per Cartridge: m ³ /hour | 40" – 80 60" – 113 (60" elements are available in horizontal vessel configuration only) |

CUNO™ High Flow Model Housing

Dimensions (mm)

Vertical Housing Models (available for 40" cartridges only)

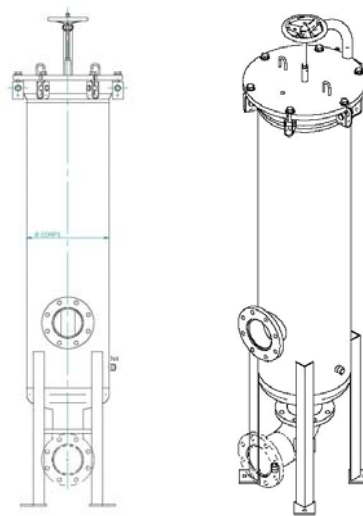
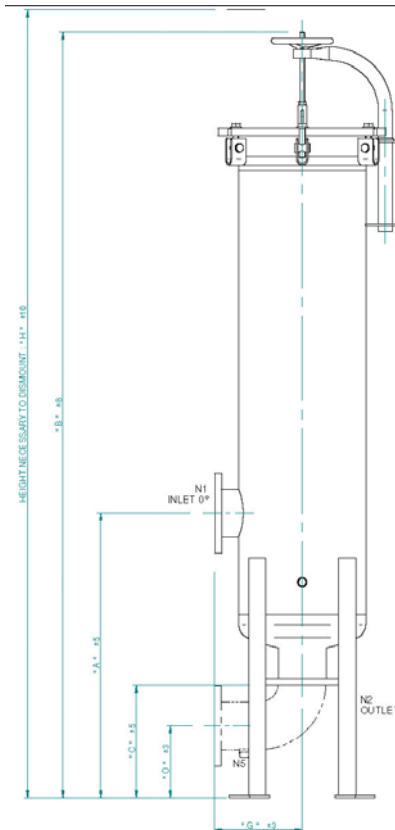
| Model | A | B | C | G | H | O (option) |
|---------|------|------|-----|-----|------|------------|
| 01HBF1V | 680 | 1850 | - | 200 | 2900 | 555 |
| 03HBF1V | 1010 | 2715 | 400 | 310 | 3500 | 255 |
| 05HBF1V | 1115 | 2815 | 500 | 350 | 3600 | 300 |
| 07HBF1V | 1210 | 2995 | 600 | 410 | 3700 | 345 |

Horizontal Housing Models

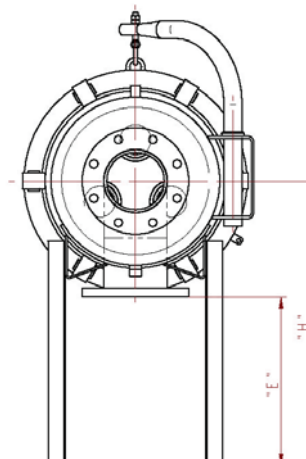
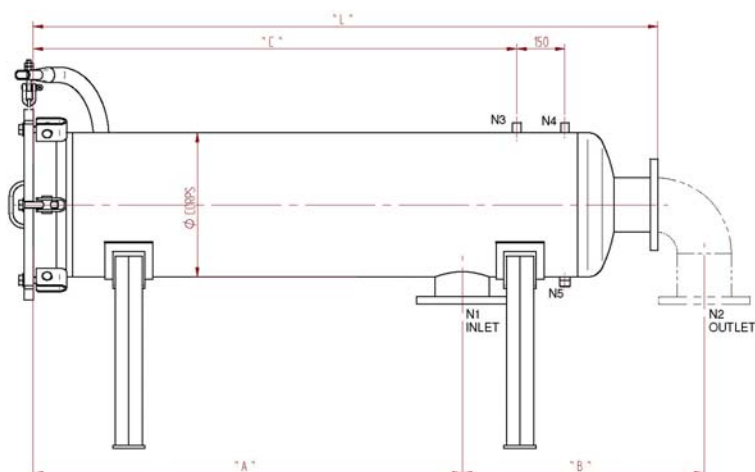
| Model | A | C | E | H | L | B (option) |
|---------|------|------|-----|------|------|------------|
| 01HBF1H | 1170 | - | 614 | 814 | 1420 | 345 |
| 01HBF2H | 1680 | - | 614 | 814 | 1930 | 345 |
| 03HBF1H | 1340 | 1510 | 500 | 810 | 1950 | 755 |
| 03HBF2H | 1850 | 2020 | 500 | 810 | 2500 | 855 |
| 05HBF1H | 1340 | 1510 | 550 | 900 | 1950 | 815 |
| 05HBF2H | 1850 | 2020 | 550 | 900 | 2500 | 905 |
| 07HBF1H | 1340 | 1510 | 650 | 1060 | 1950 | 865 |
| 07HBF2H | 1850 | 2020 | 650 | 1060 | 2500 | 955 |

Note: All Dimensions approximately for guidance only

CUNO™ High Flow Vertical Housing



CUNO™ High Flow Horizontal Housing





CUNO™ High Flow Filter Element Ordering Guide

| Filter Designation | Element Length (inches) | Material | Absolute Removal Rating (Microns) | O-Ring | Packaging Options (Per Box) |
|-----------------------|------------------------------------|---------------------------|---|--|-----------------------------|
| HF – High Flow | 40 – 40” 60 – 60” | PP - Polypropylene | 001 – 1 µm 002 – 2 µm 005 – 5 µm 010 – 10 µm 015 – 15 µm 025 – 25 µm 040 – 40 µm 070 – 70 µm | A – Silicone B – Fluorocarbon C – EPR D – Nitrile | 01 - 1 pack |

CUNO™ High Flow Housing Ordering Guide

| Number of Filter Elements | Model | Closing | Size * | Configuration | Housing Material | Gasket Material | Surface Finish | Connections** | Bottom Outlet | Elbow*** |
|--|-----------|-------------------|------------------------------------|--|--------------------------------------|---|--|--------------------------------|-------------------|--|
| 01 03 05 07 | HF | B – Bolted | 1 – 40 “ 2 – 60 “ | H – Horizontal V – Vertical | 4 – 304 L 6 – 316 L | MV – Silicone EP – Ethylene Propylene NB – Nitrile FP – Fluorocarbon | FO - Acid Pickled & Passivated/ Glass Bead Blasted | BP - Flanged (ISO PN16) | D - Bottom | N - None 1 - At 0° 2 - At 90° 3 - At 180° 4 - At 270° |

* 60” Elements are available for horizontal housings only

** Flange size will vary with number of filter elements and element length (refer to table on page 6)

*** Options 2, 3 and 4 only available on multi-element vertical housings. All others are only available with option N or 1.

Examples: 03 HFB 2 H 6 NB F0 BP D N
or 05 HFB 1 V 6 NB F0 BP D N

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